

REMARKS

Applicant has thoroughly considered the Examiner's remarks. The application has been amended to more clearly define the invention. Claims 1-5, 8-29, and 31-36 are presented in this application for further examination. Claims 6 and 7 have been canceled and claims 1, 8, 9, 16, 21, 27, and 29 have been amended by this Amendment B. Reconsideration of the application in view of the following remarks is respectfully requested.

Drawings

Applicant respectfully requests the Examiner to indicate whether the drawings submitted on May 27, 2004 are accepted.

Claim Rejections under 35 U.S.C. § 103

Claims 1-11, 14, 15, 23-28, and 33-35 stand rejected under 35 USC §103(a) as being unpatentable over Hinckley et al. (U.S. Patent Publication No. 2002/0067334) in view of Van Schyndel et al. (U.S. Patent No. 6,859,141). To establish a *prima facie* case of obviousness, the Office must demonstrate that every claim requirement is taught or suggested by the prior art.¹ Applicant respectfully submits that the cited references, alone or in combination, fail to teach or suggest each and every claim requirement as set forth in the independent claims.

Claim 1

Claim 1, as amended, discloses a data input device comprising:

an impedance sensor arranged with respect to a tracking surface, **said impedance sensor comprising at least four electrodes** and having a measurement zone within which said impedance sensor measures electrical impedance, wherein **two of said at least four electrodes comprise a capacitance sensor** for measuring an electrical capacitance between said two electrodes and wherein **two other of said at least four electrodes comprise a resistance sensor** for measuring an electrical resistance between said two other electrodes; and
a controller responsive to the measured impedance of said impedance sensor for determining a distance of spatial separation between the data input device and the

¹ In re Royka, 180 U.S.P.Q. 580, 583 (C.C.P.A. 1974) (see also M.P.E.P. § 2143).

tracking surface relative to one another as a function of the **measured impedance**, said controller initiating a non-tracking mode in which said controller suspends tracking of relative movement between said data input device and said tracking surface when said data input device is spatially separated from said tracking surface by at least a lift-off detection distance.

The amendments are supported in paragraphs 28, 33 and FIG. 6. Independent claim 1 has been amended to include both a capacitor sensor and a resistance sensor and a controller responsive to the measured impedance, i.e., capacitance and resistance, of said impedance sensor for determining a distance of spatial separation between the data input device and the tracking surface relative to one another as a function of this **measured impedance**. As explained below with respect to claim 27, Hinkley fails to teach a proximity sensor and Van Schyndel merely discloses a capacitance sensor that determines whether a physical object is **within the sensing range** of the detector. Thus, Applicant respectfully requests reconsideration and withdrawal of the rejection of independent claim 1. Claims 2-5 and 8-26, which depend directly or indirectly from claim 1, are also submitted as patentable for the same reasons as set forth above with respect to claim 1.

Claim 27

Claim 27, as amended, discloses a method comprising:
energizing at least two electrodes, said at least two electrodes being operatively connected to a data input device configured to interact with a tracking surface;
measuring an electrical impedance between said at least two electrodes;
determining the relative distance between said data input device and said tracking surface as a function of said measured impedance; and
determining the direction of relative movement between said data input device and said tracking surface as a function of said measured impedance.

The amendments are supported in paragraph 32 of the present application. For example, "a series of paired electrodes 51 are arranged along a y-direction (more electrode pairs may be incorporated in said series than are depicted in Fig. 6)" and "by detecting the time sequence of capacitance changes sensed by the paired electrodes 51, the direction of relative movement between the device 21 and the tracking surface 25 may be determined during the lift-off."

The Office correctly points out that Hinckley fails to teach or suggest a proximity sensor comprising at least two electrodes, measuring an electrical impedance between the two

electrodes and determining the relative distance between the input device and the tracking surface as a function of the measured impedance.

The Office explains that Van Schyndel teaches a sensor having an effective sensing range, the sensor processing the signals when an object approaches to within the sensing range; when no object is present within the effective sensing range of the detector, no signal is processed.² Thus, Van Schyndel merely discloses a sensor that determines whether a physical object is **within the sensing range** of the detector. Van Schyndel fails to disclose a sensor that determines **direction of relative movement** between an object and an input device.

Because both Hinckley and Van Schyndel each fail to disclose the element of determining the **direction of relative movement** between a data input device and a tracking surface as a function of a measured impedance, a combination of the two inventions also fails to disclose such an element. Accordingly, Applicant respectfully submits that the Office's combination does not teach or suggest each and every claim element of the claimed invention. As discussed above, neither cited reference teaches the processes of **measuring an electrical impedance** between the at least two electrodes and **determining the direction of relative movement** between the data input device and the tracking surface as a function of the measured impedance.

Thus, Hinckley, both alone and combined with Van Schyndel, is deficient because it fails to teach a method that determines the **direction of relative movement** between the data input device and the tracking surface as a function of a measured impedance. For at least these reasons, Applicant respectfully submits that claim 27 is patentable.

In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 27. Claims 28 and 33-36, which depend directly or indirectly from claim 27, are submitted as patentable for at least the same reasons as set forth above with respect to claim 27.

Claim 29

Claims 16-22, 29-32 and 36 stand rejected under 35 USC §103(a) as being unpatentable over Hinckley and Van Schyndel and in further view of Rabkin (US Patent Publication No. 2003/0136897). The Office cites Rabkin as disclosing a resistance

² Office action, page 2 (citing Van Schyndel col. 6, lines 40 to col. 7, line 35).

sensor or inductance sensor as a proximity sensor in the device of Hinckley as modified by Van Schyndel. But as discussed in conjunction with claims 27 and 1, the device of Hinckley as modified by Van Schyndel fails to disclose a device for determining the speed of movement of the data input device and the tracking surface relative to one another. Claim 29 has been amended to include such an element.

Claim 29, as amended, discloses a data input device comprising:

a resistance sensor arranged with respect to a tracking surface, said resistance sensor having a measurement zone within which said resistance sensor measures an electrical resistance; and
a controller responsive to the measured resistance of said resistance sensor for:

determining spatial separation between the tracking surface and the data input, said controller initiating a non-tracking mode in which said controller suspends tracking of relative movement between said data input device and said tracking surface when said data input device is spatially separated from said tracking surface by at least a lift-off detection distance; and

determining a speed of relative movement between the data input device and the tracking surface.

The amendments are supported in paragraph 32 of the present application. For example, "a series of paired electrodes 51 are arranged along a y-direction (more electrode pairs may be incorporated in said series than are depicted in Fig. 6)" and "by detecting the time sequence of capacitance changes sensed by the paired electrodes 51, the speed of relative movement between the device 21 and the tracking surface 25 may be determined during the lift-off."

The Office correctly points out that Hinckley fails to teach or suggest a proximity sensor comprising at least two electrodes, measuring an electrical impedance between the two electrodes and determining the relative distance between the input device and the tracking surface as a function of the measured impedance.

The Office explains that Van Schyndel teaches a sensor having an effective sensing range, the sensor processing the signals when an object approaches to within the sensing range; when no object is present within the effective sensing range of the detector, no signal is processed.³ Thus, Van Schyndel merely discloses a sensor that determines whether a physical object is **within the sensing range** of the detector. Van Schyndel fails to disclose a sensor that determines **the speed of relative movement** between an object and an input device.

³ Office action, page 2 (citing Van Schyndel col. 6, lines 40 to col. 7, line 35).

Because Hinckley, Van Schyndel and Rabkin each fail to disclose the element of determining the **speed of relative movement** between a data input device and a tracking surface as a function of a measured impedance, a combination of the two inventions also fails to disclose such an element. Accordingly, Applicant respectfully submits that the Office's combination does not teach or suggest each and every claim element of the claimed invention. For at least these reasons, Applicant respectfully submits that claim 29 is patentable.

In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the rejection of independent claim 29. Claims 31 and 32, which depend directly from claim 29, are submitted as patentable for the same reasons as set forth above with respect to claim 29.

It is believed that no fees are due in connection with this Amendment A. If however, the Commissioner determines a fee is due, he is hereby authorized to charge said government fees to Deposit Account No. 19-1345.

Applicant has reviewed the cited but unapplied references and has found them to be no more pertinent than the art discussed above.

Applicant wishes to expedite prosecution of this application. If the Examiner deems the claims not in condition for allowance, the Examiner is invited and encouraged to telephone the undersigned to discuss making an Examiner's amendment to place the claims in condition for allowance.

Respectfully submitted,

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